

## CLAIMS

1. A gain control apparatus comprising:

convergence coefficient determining means for  
5 determining a convergence coefficient based on a received  
level of a received signal;

detecting means for detecting a difference value  
between a reference value obtained using the received  
signal and a preset target value;

10 voltage control value calculating means for  
calculating a voltage control value based on a detection  
result of said detecting means and the convergence  
coefficient; and

amplifying means for amplifying the received signal  
15 in accordance with the voltage control value calculated  
by said voltage control value calculating means.

2. The gain control apparatus according to claim 1, further  
comprising:

average value calculating means for calculating an  
20 average value of the received level of the received signal,  
wherein said convergence coefficient determining  
means determines the convergence coefficient based on  
the average value from said average value calculating  
means.

25 3. The gain control apparatus according to claim 1, further  
comprising:

A/D converting means for performing digital  
conversion of the received signal,

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wherein said convergence coefficient determining means counts the digitally converted samples where the number of bits set in said A/D converting means is exceeded and counts the digitally converted samples for which a level of an input signal approximates to 0, and determines a convergence coefficient based on the counted number of samples.

4. The gain control apparatus according to claim 1, wherein said convergence coefficient determining means determines the convergence coefficient by comparing the received level of the received signal with a preset threshold value.

5. The gain control apparatus according to claim 2, wherein said convergence coefficient determining means determines the convergence coefficient by comparing the average value calculated by said average value calculating means with a preset threshold value.

6. The gain control apparatus according to claim 3, wherein said convergence coefficient determining means determines the convergence coefficient by comparing the counted number of samples with a preset threshold value.

7. The gain control apparatus according to claim 1, wherein said voltage control value calculating means multiplies the detection result of said detecting means by the convergence coefficient determined by said convergence coefficient determining means and adds to the multiplication result the voltage control value used at the previous control timing to calculate a new voltage

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control value.

8. The gain control apparatus according to claim 2, wherein said average value calculating means calculates an in-phase average value which is an average value of an in-phase component of the received signal and a quadrature average value which is an average value of a quadrature phase component of the received signal respectively, and squares each of the in-phase average value and the quadrature average value to add.
9. The gain control apparatus according to claim 2, wherein said average value calculating means calculates an average value of a value obtained by squaring an in-phase component of the received signal and a value obtained by squaring a quadrature phase component of the received signal.
10. The gain control apparatus according to claim 2, wherein said average value calculating means calculates an average value for a fixed interval of the received signal, and calculates a square root of the calculated average value.
11. The gain control apparatus according to claim 2, wherein said average value calculating means calculates an average value of the received signal, and adds the calculated average value and a previous average value.
12. A communication terminal apparatus provided with a gain control apparatus, said gain control apparatus comprising:

convergence coefficient determining means for

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determining a convergence coefficient based on a received level of a received signal;

detecting means for detecting a difference value between a reference value obtained using the received  
5 signal and a preset target value;

voltage control value calculating means for calculating a voltage control value based on a detection result of said detecting means and the convergence coefficient; and

10 amplifying means for amplifying the received signal in accordance with the voltage control value calculated by said voltage control value calculating means.

13. A base station apparatus provided with a gain control apparatus, said gain control apparatus comprising:

15 convergence coefficient determining means for determining the convergence coefficient based on the received level of a received signal;

detecting means for detecting a difference value between the reference value obtained using the received  
20 signal and a preset target value;

voltage control value calculating means for calculating a voltage control value based on a detection result of said detecting means and the convergence coefficient; and

25 amplifying means for amplifying the received signal in accordance with the voltage control value calculated by said voltage control value calculating means.

14. A gain control method comprising the steps of:

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determining a convergence coefficient based on a received level of a received signal;

detecting a difference value between a reference value obtained using said received signal and a preset  
5 target value;

calculating a voltage control value based on a detection result and the convergence coefficient; and

amplifying the received signal in accordance with the calculated voltage control value.

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